

Sustainable product design and manufacturing at Siemens

Sustainability metrics and environmentally compatible product design

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Overview

- Sustainability at Siemens AG
- Framework: Business Conduct Guidelines and Fit4 2010 program
- Overview of goals
- Environmental Portfolio
- Environmental Protection & Product responsibility
- Examples of sustainable manufacturing and product design at Siemens

Siemens stands for Sustainability



"I will not sell the future for momentary profit"

Werner von Siemens 1879

"Today we use the term sustainability to describe this attitude. And the principle of thinking long term rather than being shortsighted has become more important than ever before."

Barbara Kux, Spring 2009

*Member of the Siemens Managing Board
Head of Supply Chain Management and
Chief Sustainability Officer at Siemens AG*





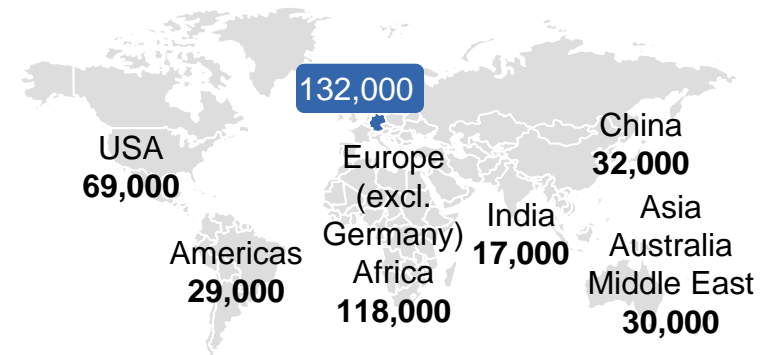
Global requirements for a company being active in 190 countries are increasing

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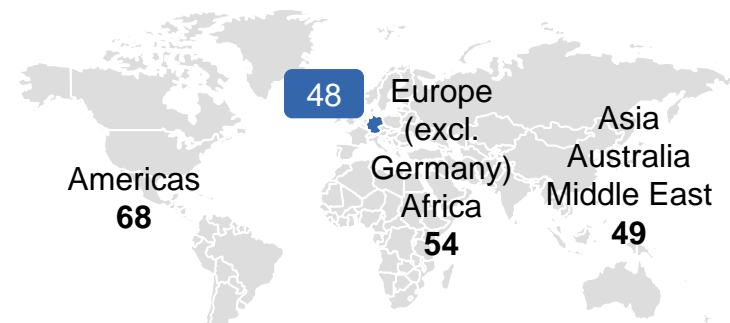
Both, requirements and opportunities are increasing globally

- Environmental legislation increases globally
- Enforcement varies from country to country but is getting stricter
- Environmental issues & climate protection are of growing public concern
- Growing pressure from stakeholders to increase corporate sustainability
- Investors include sustainability performance in their investment decisions
- Climate change is a global issue - Efforts to combat climate change offer new business opportunities for suppliers of efficient products and systems

Employees: 427,000 in 2008



Major manufacturing locations (2008) : 219



Overall environmentally relevant sites: ~320

Siemens sectors



The Industry Sector offers a wide spectrum of products, services and solutions for industry and infrastructure customers.



The Energy Sector offers a wide range of efficient products, services and solutions along the entire chain of energy conversion – from the extraction of oil and gas to power generation, transmission and distribution.



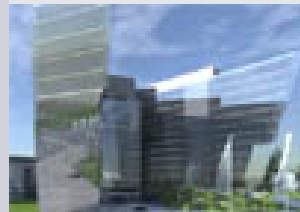
The Healthcare Sector develops, manufactures and markets diagnostic and therapeutic systems, devices and consumables, as well as IT systems for clinical and administrative purposes.

Cross-Sector Businesses



Comprehensive IT and communications solutions.
Financial solutions in the business-to-business arena.

Cross-Sector Services

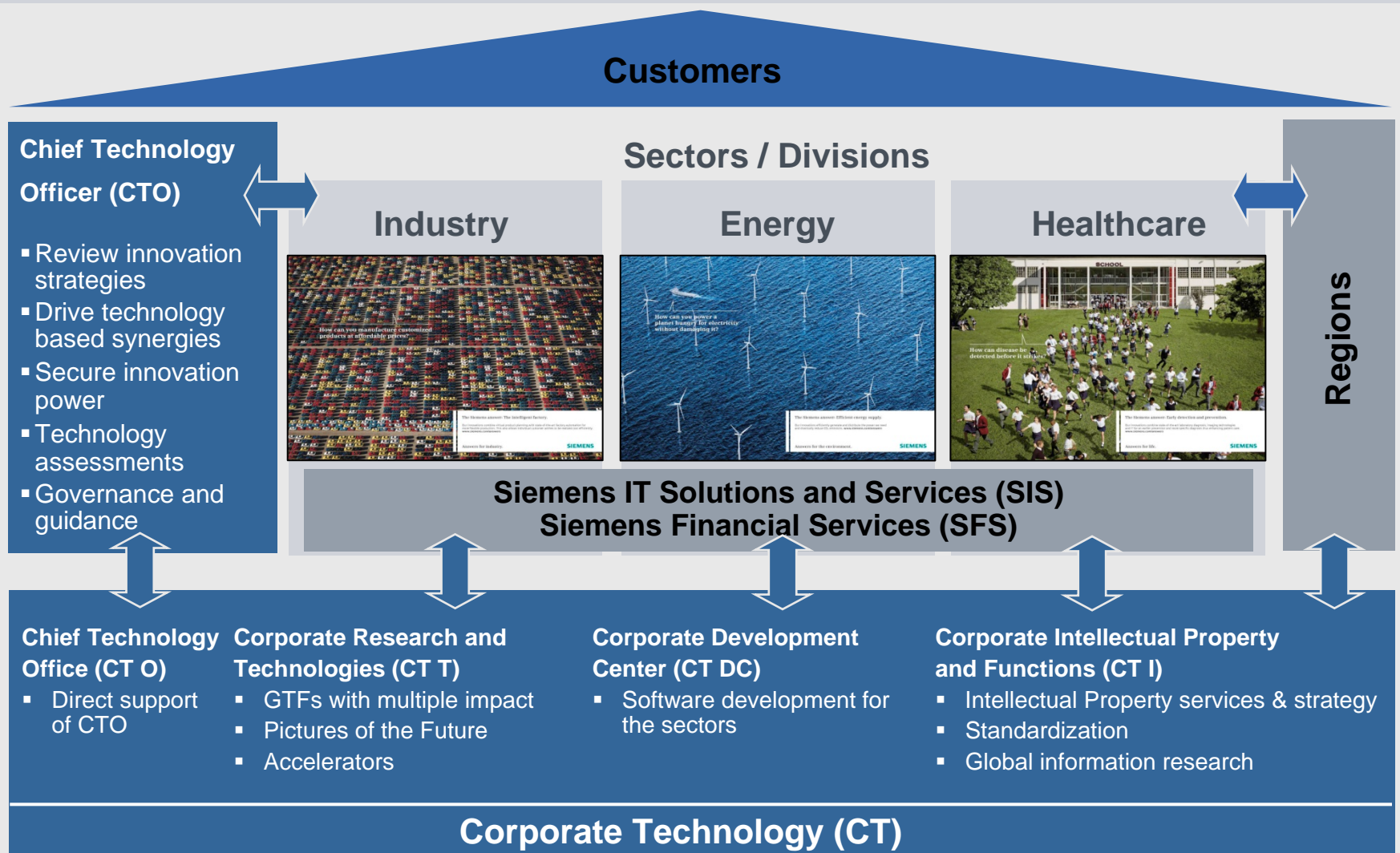


Development, planning, and management of office and commercial property.

Corporate Technology

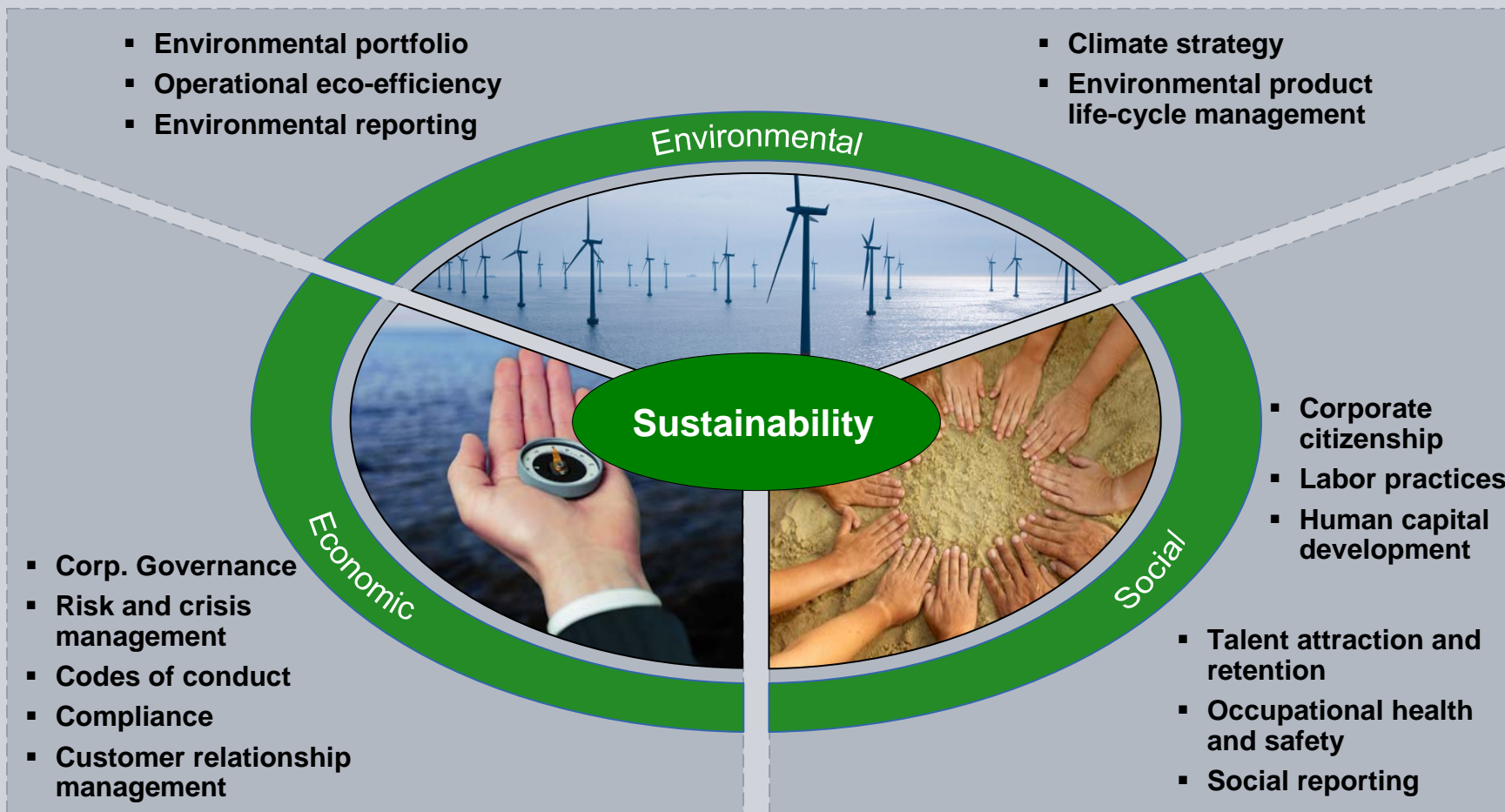
Networking the integrated technology company

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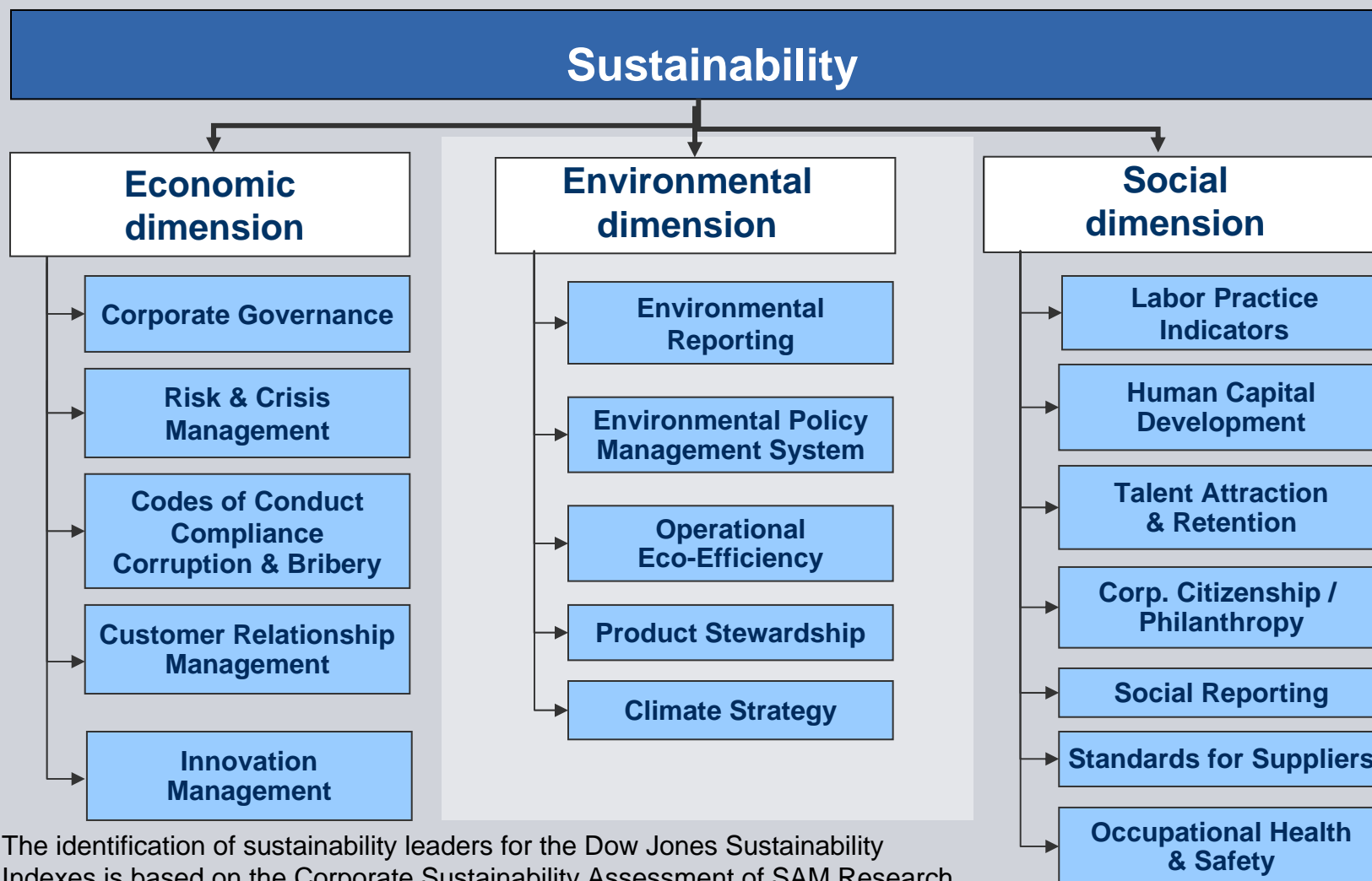


Sustainability is commonly measured as performance along a "triple bottom line"

Sustainability dimensions



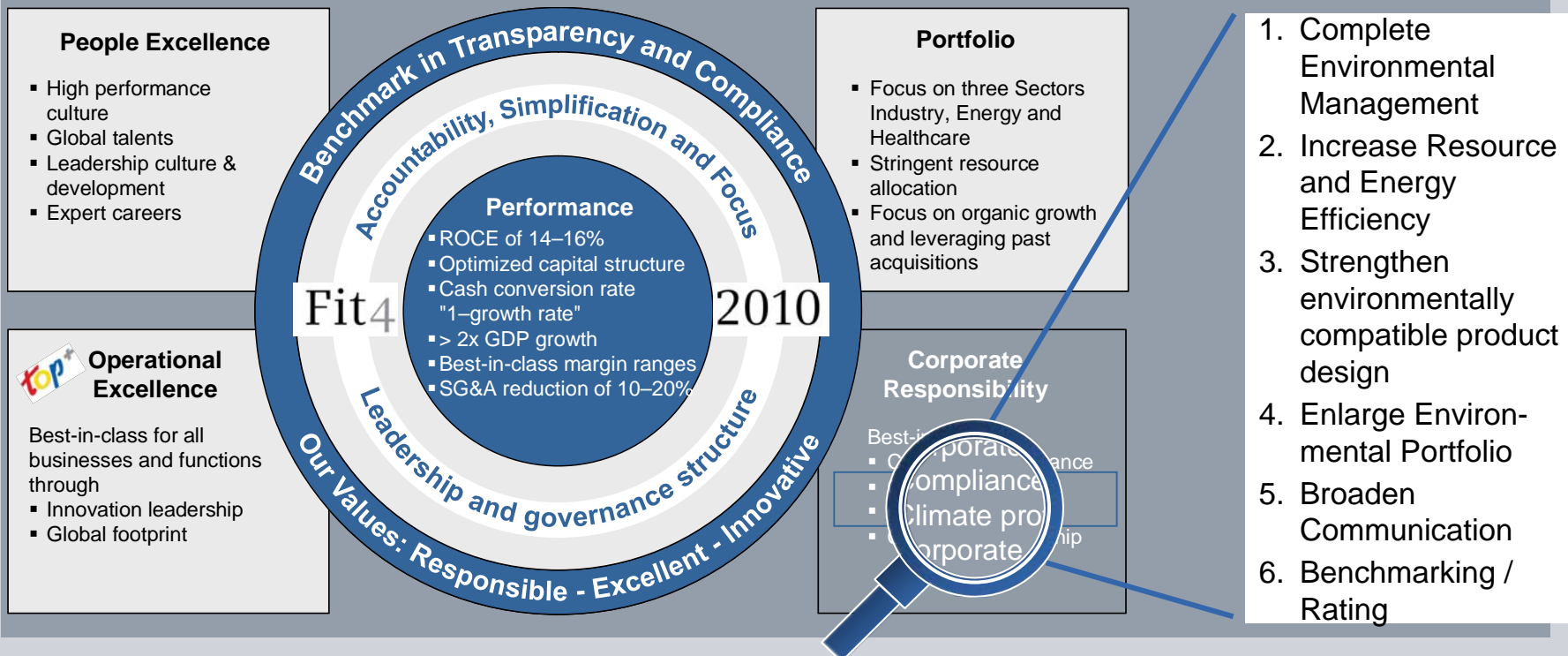
Optimization of Sustainability according to the Dow Jones Sustainability Index approach



Fit4 2010 company-wide program

Fit4 2010 establishes a comprehensive system of targets and indicators for measuring success with:

- a portfolio strategy focused on strengths in the areas of Industry, Energy and Healthcare,
- a corporate culture that empowers employees to maximize their performance,
- a global innovation strategy that links technology with business ideas, and responsible business conduct that adheres to the highest ethical standards.



Fit42010: Corporate Responsibility Corporate Environmental Protection Program

Improved resource and energy efficiency in production

Use of:

- Fossil energy
- Electrical energy
- Water

- Annual efficiency gains to add up to 20% by 2011 (starting in 2006).

Waste reduction

- Annual efficiency gains to add up to 15% and by 2011 (starting in 2006).

Emissions reduction CO2

- Annual efficiency gains to add up to 20% and by 2011 (starting in 2006).

Rigorous implementation of environmentally-compatible product design

Expansion of the environmental portfolio

Siemens Aktiengesellschaft
Vorstand

München, 14. Mai 2008

Verteiler:
ABR, u. Vizepräsident, Mitglieder d. Vorstands;
CEOs / CFOs d. Sektors / Divisions / Cross-Sector
Businesses; / Regional Offices; H&L; Utp. d.
Gesells. Darstell. Utp. d. Regionalgesellschaften,
Verbundenen Unternehmen (u. C&S); ES-Officers
Divisions / Regions; Funktionsstellen 1 - 4; Ög.; G&H

V-Rundschreiben Nr. 14/2008

Fit42010 – Corporate Responsibility:
Unternehmensprogramm Umweltschutz

Siemens hat ein Unternehmensprogramm zum Umweltschutz (Umweltprogramm) beschlossen, um "Best-in-Class bei Corporate Responsibility" zu werden und in umweltrelevanten Zukunftsmärkten zu wachsen. Damit wird im Rahmen von Fit42010 der erfolgreich eingeschlagene Weg konsequent fortgesetzt.

Die Schwerpunkte des Umweltprogramms sind:

- Flächendeckende Einführung des Umweltmanagements
- Steigerung der Ressourcen- und Energieeffizienz in der Produktion
- Konsequente umweltverträgliche Produktgestaltung
- Erweiterung des Umweltportfolios

Die Ziele des Programms sind in der Anlage festgelegt. Verantwortlich für die Umsetzung sind die CEOs der Divisions, die von den jeweiligen Referenten für Umweltschutz und Technische Sicherheit unterstützt werden.

Die fachliche Koordination für das Umweltprogramm liegt bei Herrn Dr. Bloch, CT ES.

In allen Verbundenen Unternehmen ist das Umweltprogramm gemäß Z-RS Nr. 3/2008 umzusetzen.

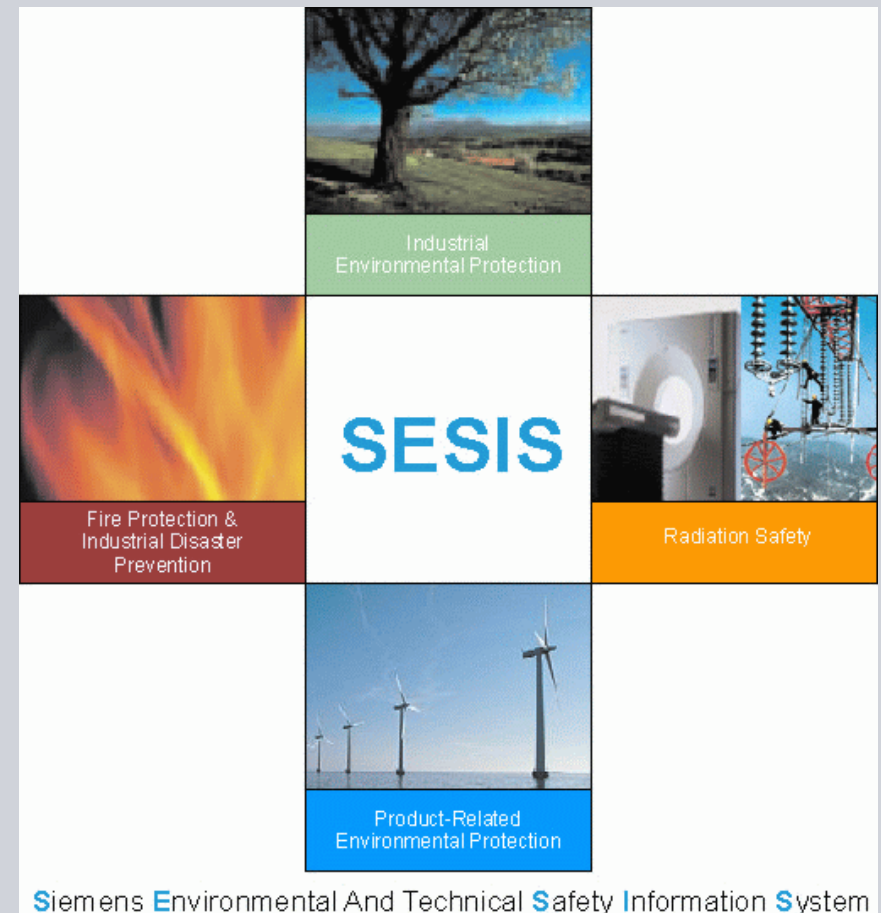
Anlage

gez. Löscher gez. Requardt

Environmental performance and internal reporting

Monitoring and reporting are indispensable elements of legal responsibility.

SEGIS (Siemens Environmental and technical Safety Information System) is our process for internal reporting

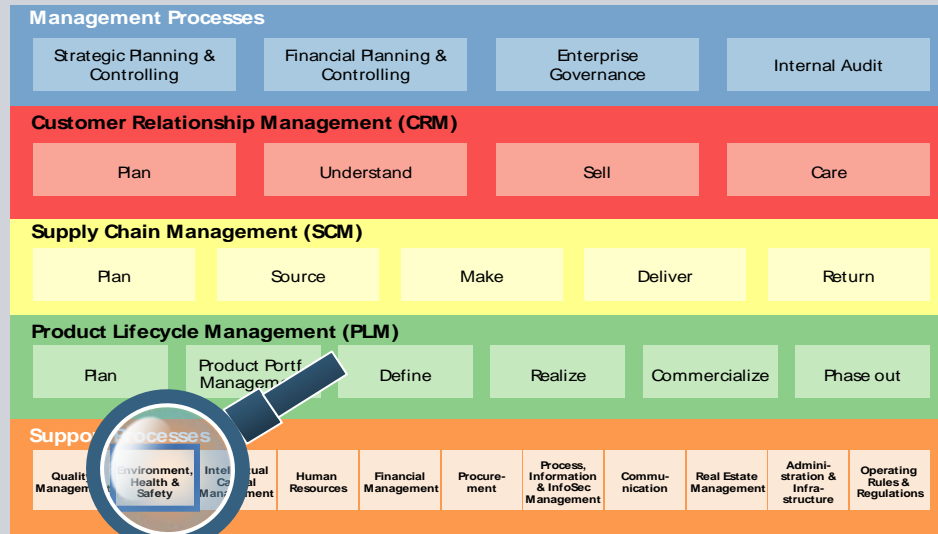


Product-Related Environmental Protection

- **Consistently environmentally compatible product and system design (SN 36350, Part 1):**
 - The requirements regarding environmentally compatible product and system design will be implemented by the end of fiscal year 2010 in the Product Lifecycle Management (PLM) and Supply Chain Management (SCM) business processes.
- **Management of substances used in products (SN 36350, Part 2):**
 - The requirements for the management of substances used in products and systems will be implemented by the end of fiscal year 2010 and will be take into consideration contracts with suppliers.
- **Product environmental declarations (SN 36350, Part 7):**
 - Product environmental declarations will be drafted for selected product families by the 2010 fiscal year

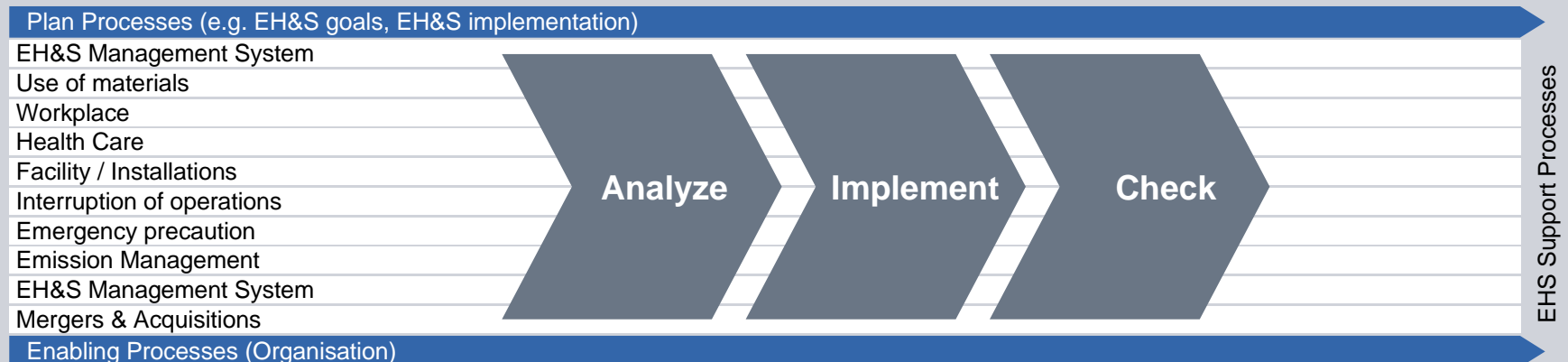


Integration of environmental requirements in business processes



The Siemens Reference Process House

- Serves as the basis for company-wide process management
- Describes the management, business and support processes at Siemens
- Covers all types of business (products, systems, projects, solutions and services) and combines all process standardization activities under one roof



Product Responsibility

Assessing environmental impacts

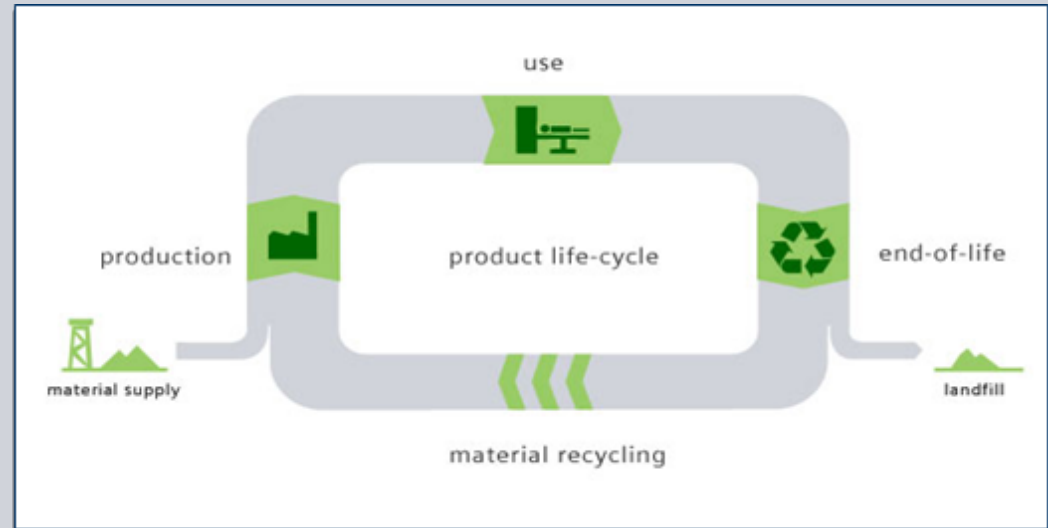
- Siemens conducts life cycle assessments (LCAs) in accordance with the international DIN ISO 14040 standard to systematically analyze its products' cradle-to-grave environmental impacts.

Environmental product declarations

- LCAs provide the basis for environmental product declarations (EPD).
- Environmental product declarations provide an overview of the environmental performance of a service or product.



- The declaration serves as a communication instrument to the end-customer.



The entire Siemens product portfolio was characterized by:

- 41% of total revenue was attributed to products & solutions that involved a full LCA.
- 68% of total revenue was attributed to products & solutions that involved a screening LCA such as Cumulative Energy Demand (CED)
- Products with EPDs generated 44 % of the Environmental Portfolio total revenue.

Environmental portfolio: World leading products and solutions

The Environmental Portfolio comprises energy-efficient products and solutions and environmental and renewable energy technologies that are helping customers to cut their CO₂ emissions, reduce life cycle costs, and improve their environmental performance.



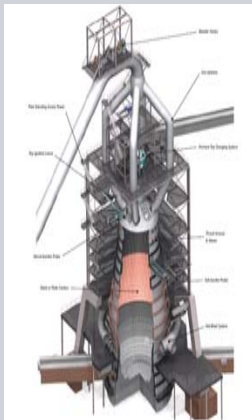
- In fiscal 2008, the Portfolio generated revenue of nearly €19 billion – around a quarter of Siemens' total revenue
- These products and solutions helped our customers reduce their CO₂ emissions by around 148 million tons in 2008 – which is more than 35 times the amount of CO₂ that Siemens itself produced with its own business activities.
- The independent auditors PricewaterhouseCoopers (PwC) examined the company's revenues, CO₂ abatement and basic methods for determining the Environmental Portfolio.

Source: http://w1.siemens.com/entry/cc/en/energy_environment.htm

A better ecobalance in steel production

The COREX® and FINEX® processes for the production of iron and steel are more environmentally compatible.

- The Industry Sector commissioned a comprehensive life cycle assessment study of these production processes to explore their environmental impacts.
- The study compared COREX and FINEX with the traditional blast furnace process, recording the impacts on air, soil and water. Each step was then evaluated: from the extraction and conditioning of raw materials to the manufacturing process, de-dusting, gas cleaning, and desulfurization.



- In contrast to a blast furnace, COREX® requires neither coke nor sinter to produce pig iron from iron ore.
- The FINEX® process allows pig iron to be produced from fine ore in just a single process step.
- COREX and FINEX were found to produce significantly lower quantities of sulfur dioxide, nitrogen oxides and dust, and the process' wastewater contained far fewer pollutants.
- Steelmakers can put the by-product gas to effective use, as a source of energy for heating steelworks or driving high-efficiency gas and steam turbines.

Life Cycle Assessment of LED lamps

Comparative Assessment

- Complete life cycle analyzed:



- Detailed analysis of front-end and back-end processes for LED manufacturing carried out (raw materials, energy demand, emissions)
- Comparison between:

<p>Incandescent Lamp GLS Classic A 40 W Lifetime: 1.000 h</p> <p>25 x</p> 	<p>Compact Fluorescent Lamp CFL DULUX Superstar Classic A 8 W Lifetime: 10.000 h</p> <p>2,5 x</p> 	<p>LED Lamp Parathom A55 with Golden Dragon LEDs 8 W Lifetime: 25.000 h</p> <p>1 x</p> 
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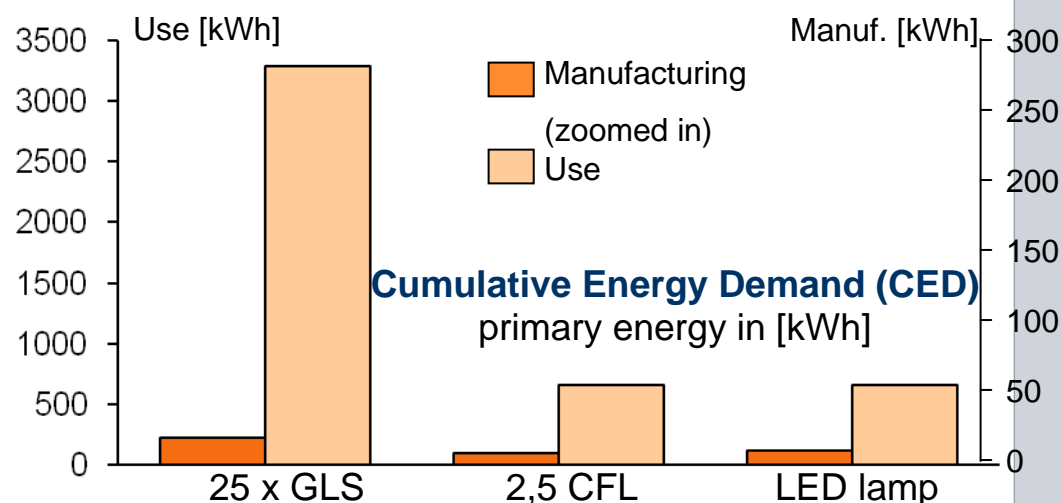
Life Cycle Assessment of LED lamps

Preliminary Results

The life cycle assessment shows that similar to compact fluorescent lamps with LED-based lamps:

- Over 98% of the energy used is consumed to generate light. Less than 2 % of the total energy demand is allocated to manufacturing.
- This has dismissed any concern that manufacturing of LED might be very energy-intensive.
- In contrast to the primary energy consumption of incandescent lamps of around 3,300kWh, LED lamps use less than 700kWh.

- LED lamps are more efficient than conventional incandescent lamps.
- In the future, efficiency improvement of LEDs will further reduce CED



Source: Osram, Opto Semiconductors (02.04.2009)

Reporting / Benchmarking / Ratings

Dow Jones Sustainability Index (2008)

The DJSI is the most important sustainability index and includes the top ten percent of the 2,500 largest companies listed in the Dow Jones Global Index.

This is the tenth time in a row that Siemens has been honored by Dow Jones analysts for its sustainable activities.



- This year's overall result is the best the company has ever achieved.
- Siemens captured the No. 1 spot in the sector Diversified Industrials.
- Siemens expanded its leading position in Compliance and Risk Management categories

Carbon Disclosure Project (2008)

Not-for-profit organization holding the largest database of primary corporate climate change information in the world.

Siemens is member of the Carbon Disclosure Leadership Index (CDLI). CDP represents investors with assets of over \$57 trillion under management.

CARBON
DISCLOSURE
PROJECT

Supply Chain Management

- In 2008, Siemens embarked on a study in association with a select group of logistics providers to explore and optimize aspects of the supply chain with a relevance for climate protection and increase transparency on CO2 emissions caused by transport processes.

Acknowledgements and contact information

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